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09/629,337	08/01/2000	Mark C. Fowler	0100.0001160	7287

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EXAMINER

BRIER, JEFFERY A

ART UNIT	PAPER NUMBER
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2672

DATE MAILED: 02/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/629,337

Applicant(s)

FOWLER ET AL.

Examiner

Jeffery A. Brier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18 and 19 is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-12, 16, 17, 20 and 21 is/are rejected.
- 7) ☒ Claim(s) 4-6 and 13-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/01/2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. The examiner in charge of this application has changed to Primary Examiner Jeffery A. Brier.

***Response to Amendment***

2. The amendment filed on 11/21/2005 has been entered.

***Response to Arguments***

3. Applicant's arguments filed 11/21/2005 have been fully considered but they are not persuasive because Watanabe at paragraph 0114 discusses the detailed clipping stage S24 as "only the view objects included in the view volume are selected from those selected in S22 by known techniques. Thus, Watanabe similar to applicant has built upon that which was practiced in the art and modified it so as to select only the objects within the view volume. Thus, applicant arguments are not persuasive. The previous rejection is maintained and reproduced below without modification.

***Drawings***

4. The drawings are objected to because with regards to figure 3 and page 6 last paragraph and page 10:

reference number 302 is used twice, the second one should be reference number 306;

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306 is described at page 6 last paragraph but it is not present in the drawings;

320 is present but not described, it should be 310;

310 is described but not shown in the drawing; and

324 is discussed on page 10 but not shown.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) or to change the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

5. The disclosure is objected to because of the following informalities:

page 8 at line 17 XFIR is confusing since the specification mainly refers to XDIR;  
and

page 8 at lines 4, 6, and 17 and page 11 at lines 8 and 10 discuss XDIR and YDIR but do not describe the difference between XDIR and XDIR as well as the difference between YDIR and YDIR. Similar note should be made of claims 6, 13, 14, 15, and 18 in contrast with claims 3 and 4.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3,7-12,16-17 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al (5,040,130) in view of Watanabe et al (US 2001/0013867).

Regarding claims 1-2,9 and 20, Chang et al discloses that the claimed feature of a method for rasterizing primitives, comprising the steps of: determining if a primitive is totally outside [i.e. Fig 4C] a predetermined screen region [i.e. "clipping window" 42, 152 in visible side of Figs 3,7A] or at least partially [i.e. Fig 3A, Fig 4B, Fig 4D, Fig 7A] within the predetermined screen region, discarding the primitive if the primitive [i.e. edge 52c in Fig 4C] is totally outside the screen region [i.e. "visible side"] ("both vertex P1,P2 are dropped, neither is preserved for display", See col 6 line 24-28), finding at least a portion of the primitive [i.e. Fig 3A, Fig 4B, Fig 4D, Fig 7A] that is inside the screen region if the primitive is not totally outside the screen region, filling ["area fill processor"; 29] only pixels in the portion of the primitive that is inside the screen region, when a start vertex for edgewalking the primitive is outside of the screen region [i.e. invisible side], then starting edgewalking with the start vertex and proceeding to an intersection point [i.e. P8', P3',P4',P7' in Fig 3] with the screen region [42] the primitive [40] at which time only the portion of the primitive that is inside ["visible side"] the screen region if filled, wherein if the start vertex of the primitive is inside of the screen region, then filling only pixels in the portion of the primitive that is inside the screen region (See col 17 line 31-35; also see Fig 3, Fig 7, Fig 10-12, Abstract, col 3 line 14-27, col 9 line 60-col 10 line 18, col 17 line 59-65, claims 12 and 17), repeating the method steps for each primitive of a plurality of primitives ("repeating the above steps until all edges of the boundary-defined area are processed", See col 3 line 17-19, Also See "repeating steps" in claims), and the primitive is a triangle [i.e. Fig 11]

Chang et al does not specifically disclose that "filling only pixels in the portion of the primitive that is inside the screen region." However, such limitation is shown in the teaching of Watanabe et al. (See Fig 1, Fig 2, Fig 9, [8]) [i.e. rasterizing objects [S10] after clipping [S24], See paragraph 0114.

It would have been obvious to one skilled in the art to incorporate the teaching of Watanabe et al into the teaching of Chang et al, in order to eliminate the unnecessary time of pixel filling process [i.e. rasterization] for the portion of primitives, where it will not be rendered in final image, as such improvement is also advantageously desirable in the teaching of Chang et al for saving total processing time with maximum efficiency.

Regarding claims 10-12 and 16-17, claims 10-12 and 16-17 are similar in scope to the claims 1-2 and 9, and thus the rejections to claims 1-2 and 9 hereinabove are also applicable to claims 10-12 and 16-17.

Regarding claim 3, Chang et al discloses that using X,Y coordinate system; and determining values of XSTART,YSTART,XEND,YEND for the primitive, Providing values of XLEFT,XRIGHT,YTOP,YBOTTOM for the screen region; and comparing the primitive values to the screen region values to determine if the primitive is totally outside the screen region. (See Fig 3a-3c, Fig 4a-4d, Fig 5, Fig 7a, Fig 8a, Fig 9a) ["a method for clipping a line segment boundary defined area [primitives] against a limiting plane [screen region] using the coordinate values of viewing region [42,152] and a primitive [40,150]"]

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Regarding claims 7, Change et al further discloses that the steps of: defining a start point on an edge of the primitive; determining if the start point is outside the screen region; edge walking the edge of the primitive from the start point to a boundary of the screen region; span walking a portion of the primitive inside the screen region and filling each pixel in the portion of the primitive that is inside the screen region. (See Fig 3a-3c, Fig 4a-4d, Fig 5, Fig 7a, Fig 8a, Fig 9a)

Regarding claim 8, Chang et al discloses that the primitive is a triangle and the start point is a vertex of the triangle. (See Fig 11)

Regarding claim 21, Chang et al discloses that filling only pixels in the portion of the primitive that is inside the screen region ends when all pixels within the portion of the primitive inside the screen region have been filled. (See Fig 3)

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Akeley et al, US Patent No. 5,051,737, teaches at column 12 lines 43-57 describes clipping a polygon to the view space, see for example points I1, I2.

Maillot, US Patent No. 5,079,719, clips a polygon to view space by determining turning points.



***Allowable Subject Matter***

Claims 18 and 19 are allowed.

Claims 4-6 and 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The present invention is directed to a computer system for rasterizing primitives. The above claims identifies the uniquely distinct features "Defining first and second x direction values of 0 and 1, respectively, for an x direction XDIR in the coordinate system as, respectively, left to right and right to left relative to the screen region, and defining first and second y direction values as 0 and 1, respectively, for a y direction YDIR in the coordinate system as, respectively, top to bottom and bottom to top; determining that the primitive is totally outside the screen area if at least one of the following is logically true given a start point X=XSTART and Y=YSTART fro the primitive:  $XDIR \text{ AND } ((X < XLEFT) \text{ OR } (XEND > XRIGHT))$ ,  $XDIR' \text{ AND } ((X > XRIGHT) \text{ OR } (XEND > XLEFT))$ ,  $YDIR \text{ AND } ((Y < YTOP) \text{ OR } (YEND > YBOTTOM))$ ,  $YDIR' \text{ AND } ((Y > YBOTTOM) \text{ OR } (YEND < YTOP))$ . Incrementing Y if a first value,  $((YDIR \text{ AND } (Y > YBOTTOM)) \text{ OR } (YDIR' \text{ AND } (Y < YTOP)))$ , is logically true; Incrementing X if a first value,  $((XDIR \text{ AND } (X > XRIGHT)) \text{ OR } (XDIR' \text{ AND } (X < XLEFT)))$ , is logically true; repeating two above steps until the first and second values are not true, which identifies a beginning of a portion of the primitive that is inside of the screen region. The filling is finished when one of the following is true:  $(XDIR \text{ AND } (X < XLEFT))$ ,  $(XDIR' \text{ AND } (X >$

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XRIGHT)), (YDIR AND (Y<YTOP)), (YDIR' AND (Y>YBOTTOM))." The closest prior art, Chang et al (5,040,130) discloses similar image processing system, either singularly or in combination, fail to anticipate or render the above underlined limitations obvious.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffery A Brier whose telephone number is (571) 272-7656. The examiner can normally be reached on M-F from 7:00 to 3:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael

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Razavi, can be reached at (571) 272-7664. The fax phone Number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jeffery A Brier  
Primary Examiner  
Art Unit 2672